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# Forest Insect and Disease Management

5230
BIOLOGICAL
EVALUATION R2-76-13

MOUNTAIN PINE BEETLE

UTE PASS DCA

Pike National Forest
and
Private Lands

DECEMBER 1976

## Rocky Mountain Region

U.S. Department of Agriculture Forest Service

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## INTRODUCTION

The mountain pine beetle has been active in ponderosa and limber pines on private and Federal lands in the Ute Pass area of the Pike National Forest for 2 or 3 years. Private landowners in the area have expressed concern about beetle populations on their land and the possibility of beetles coming from infestations on Federal land. The area from Manitou Springs to and including, Woodland Park has been classified as a Designated Control Area (DCA) by the Colorado State Forest Service. The Colorado State Forest Service, with the cooperation of the Pikes Peak Ranger District, Pike National Forest, is presently planning direct chemical control of the mountain pine beetle population within the DCA.

During the last week in November Vernon Creasap and James Linnane, Entomolgists, Vincent Pace and Kent Eggleston, Biological Technicians, conducted an evaluation survey of the area, with the aid of personnel from the Colorado State Forest Service and the U. S. Forest Service, Pike and San Isabel National Forests. One-chain wide cruise strips with variable radius prism points at 5 chain intervals were run through infested areas on Federal land to collect build-up ratio and stand composition data. An aerial survey was conducted to map beetle kill areas to aid the ground survey.

The purpose of this evaluation is to provide a current assessment of the infestation and to make recommendations for prevention and suppression of mountain pine beetle populations.

## TECHNICAL INFORMATION

Causal agent: *Dendroctonus ponderosae* Hopk., mountain pine beetle.

Hosts: *Pinus ponderosa* Hopk., ponderosa pine; *P. flexilis* James, limber pine.

Location of infestation: The infestation is located along state highway 24 through Ute Pass from Manitou Springs to and around Woodland Park, Colorado (Figure 1). The beetles are causing tree mortality on private and National Forest lands.

Type of damage: Tree killing, at present, is confined mostly to small groups of a few trees (2 to 6), to a few (2 sighted from the aerial survey) large groups (25 or larger).

Stand data: A survey was conducted by personnel from the Forest Service regional office with the help of personnel from the Colorado State Forest Service and Pikes Peak Ranger District, Pike National Forest. One-chain wide cruise strips were run to obtain ratios of 1975- to 1976-infested trees. Variable point plots (10 BAF) were taken at five chain intervals to obtain stand composition data.

## RESULTS

There appears to be about 2000 infested trees on about 6000 acres of Forest Service land. The average of 0.33 trees per acre shows the beetle population to be endemic over the general area, although there are two large groups, over 25 trees, which may be considered epidemic. The low average basal area per acre (Table 1) is not indicative of a potential beetle outbreak. However, the site of the area is poor, according to Pikes Peak Ranger District personnel, which would tend to indicate that continuing mortality of ponderosa and limber pines from mountain pine beetle may be expected. Basal area has been reduced from an average of 69 to 58 sq ft/acre. Even though basal area has been reduced, there are still quite a large percentage of mature and overmature trees left in the area. Cruise strip data show that the build-up ratio of 1975- to 1976-infested trees is 1:0.93 (Table 2), indicating a static population level. Plot data indicate that the average DBH of 1976 infested trees is down slightly from the average DBH of 1975 infested trees (Table 3). The average percent ponderosa pine composition of the stand has been reduced from 75% to about 71% (Table 4).

## DISCUSSION AND CONCLUSIONS

Table 1 summarizes the basal area of the stand. Maximum basal area, based on individual plots, ranges from 120 to 160 sq ft/acre per line, while the average is 69 sq ft/acre for all species including dead trees. The average residual basal area is 58 sq ft/acre. Table 2 shows the build-up ratio of 1975- to 1976-infested trees. Table 3 summarizes the average DBH of all species and, also pine total, residual and infested pine. Table 4 summarizes the residual stand composition, showing the reduction in ponderosa pine composition due to beetle mortality. The average reduction of ponderosa pine composition is 3 percent.

In summary, the data indicates that there is a static population of mountain pine beetle in ponderosa and limber pines within the Ute Pass DCA. Although a maximum BA/acre of 160 sq ft/acre was found, the average BA/acre was considerably lower. The average

BA/acre was 68.8 sq ft/acre while the residual average BA/acre was 57.9 sq ft/acre (Table 1). The silvicultural treatment generally recommended for mountain pine beetle control in ponderosa pine is to reduce the growing stock level to between 60 and 80. However, on poor sites, growing stock level may have to be reduced further with emphasis placed on removing mature, overmature, damaged and dwarf mistletoe infested trees, which may be susceptible to beetle attack.

While mountain pine beetle does exist within the DCA, it is not a serious threat at the present time. Losses to the mountain pine beetle in this area are not as great as those on other areas of the southern front range.[1/]

During the survey, slope readings were taken. Much of the area showed to be in excess of 70% slope, while a large percentage is in excess of 30%, which limits tractor, crawler or rubber tire, logging. Some of the area is operable, less than 30% slope, for tractor logging.

The recommendation, for mountain pine beetle control in the Ute Pass DCA, put forth by the Colorado State Forest Service[2/] is direct control by cutting infested trees and treating with ethylene-dibromide. Direct control at best only provides temporary relief from mountain pine beetle populations. Protection from recurring populations can not be expected to last more than 3 or 4 years. More effective control cannot be expected as long as stands are not under management. Treatment of infested trees on slopes over 70% will present a safety hazard both in the felling of the trees and in the use and handling of chemicals on steep slopes. Topography and access may limit control efforts. If beetle infested trees have to be left on steeper slopes, effectiveness of the control efforts will be reduced. Residual beetle populations will reinvade the stands.

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1/ Creasap, V. L. M., C. D. Minnemeyer. Biological Evaluation R2-76-9 Mountain Pine Beetle on the Colorado Front Range. November 1976.

2/ USDA, Forest Service Project Proposal, Ute Pass MPB, Pike National Forest, Pikes Peak District. September 27, 1976.

## RECOMMENDATIONS

Private landowners should be encouraged to set up a cooperative timber sale with the Forest Service, bringing as much operable land under management as possible in areas above 60 to 80 BA. Reconsideration should be given to the use of direct control for mountain pine beetle in the Ute Pass DCA. All people involved should be informed that direct control is only a temporary control measure and not a long term solution.

Pikes Peak Ranger District and private landowners should manage their stands by reducing the inventory of mature and overmature trees, thereby reducing susceptibility of the remaining stand to mountain pine beetle attack. This will also reduce costly expenditure for direct control by reducing the area to be covered by direct control measures. Landowners may also realize a profit from the sale of their trees, in lieu of the cost for direct control. Proper management will also reduce dwarf mistletoe infestations as well as reduce mountain pine beetle hazard.

Chemical treatment of infested trees is recommended only if the vigor of the stands is improved. Chemical control can be used to treat infested trees on land inaccessible or inoperable for logging. Some infested trees will be missed on slopes too steep for safe felling of the trees or handling of chemicals. Chemical control is only recommended as a back-up to silvicultural control of the mountain pine beetle.

Application of the chemical carbaryl to non-infested trees is an alternative which may be used for protecting particularly high value trees, around homes and businesses. The only product registered in Colorado is "Pine Tree and Ornamental Spray"* and should be applied according to label directions prior to beetle flight.

*"Pine Tree and Ornamental Spray" is the only preventative spray registered in Colorado for use against mountain pine beetle. The spray is formulated by Balcom Chemical Inc., 240 22nd Street, Greeley, Colorado 80631.

TABLE 1

UTE PASS - BASAL AREA SUMMARY

| AREA | NUMBER OF PLOTS | NUMBER OF PLOT TREES | NUMBER OF LIVE TREES | AVERAGE BA PER ACRE | AVERAGE GREEN TREE BA PER ACRE | MAXIMUM PLOT BA PER ACRE |
|---|---|---|---|---|---|---|
| | ALL SPECIES | | | | | |
| Wellington Gulch | 18 | 155 | 117 | 86.1 | 65.0 | 130 |
| Cascade | 34 | 219 | 198 | 64.4 | 58.2 | 120 |
| Crystola | 31 | 234 | 223 | 78.7 | 74.5 | 160 |
| Severy Creek | 23 | 177 | 124 | 77.0 | 53.9 | 120 |
| Green Mountain Falls | 19 | 76 | 62 | 40.0 | 32.6 | 120 |
| TOTAL | 125 | 861 | 724 | ---- | ---- | --- |
| AVERAGE | --- | --- | --- | 68.9 | 57.9 | --- |

TABLE 2

UTE PASS - 1976 BUILD-UP RATIO

| AREA | NUMBER OF ACRES | 1976 INFESTED TREES | 1976 INFESTED TREES PER ACRE[1] | 1975 INFESTED TREES | 1975 INFESTED TREES PER ACRE | 75 : 76 RATIO |
|---|---|---|---|---|---|---|
| Wellington Gulch | 8.0 | 21 | 2.6 | 4 | 0.5 | 1 : 5.25 |
| Cascade | 17.0 | 35 | 2.1 | 14 | 0.8 | 1 : 2.50 |
| Crystola | 14.5 | 10 | 0.7 | 21 | 1.4 | 1 : 0.48 |
| Severy Creek | 10.5 | 19 | 1.8 | 58 | 5.7 | 1 : 0.33 |
| Green Mountain Falls | 9.5 | 5 | 0.5 | 0 | 0.0 | -------- |
| TOTAL | 59.5 | 90 | --- | 97 | --- | -------- |
| AVERAGE | ---- | -- | 1.5 | -- | 1.6 | 1 : 0.93 |

[1] Average infested trees per acre is higher than stated in Results section. The lines were run through infested areas, therby biasing the results in the table. The actual average infested trees per acre is 0.33.

TABLE 3

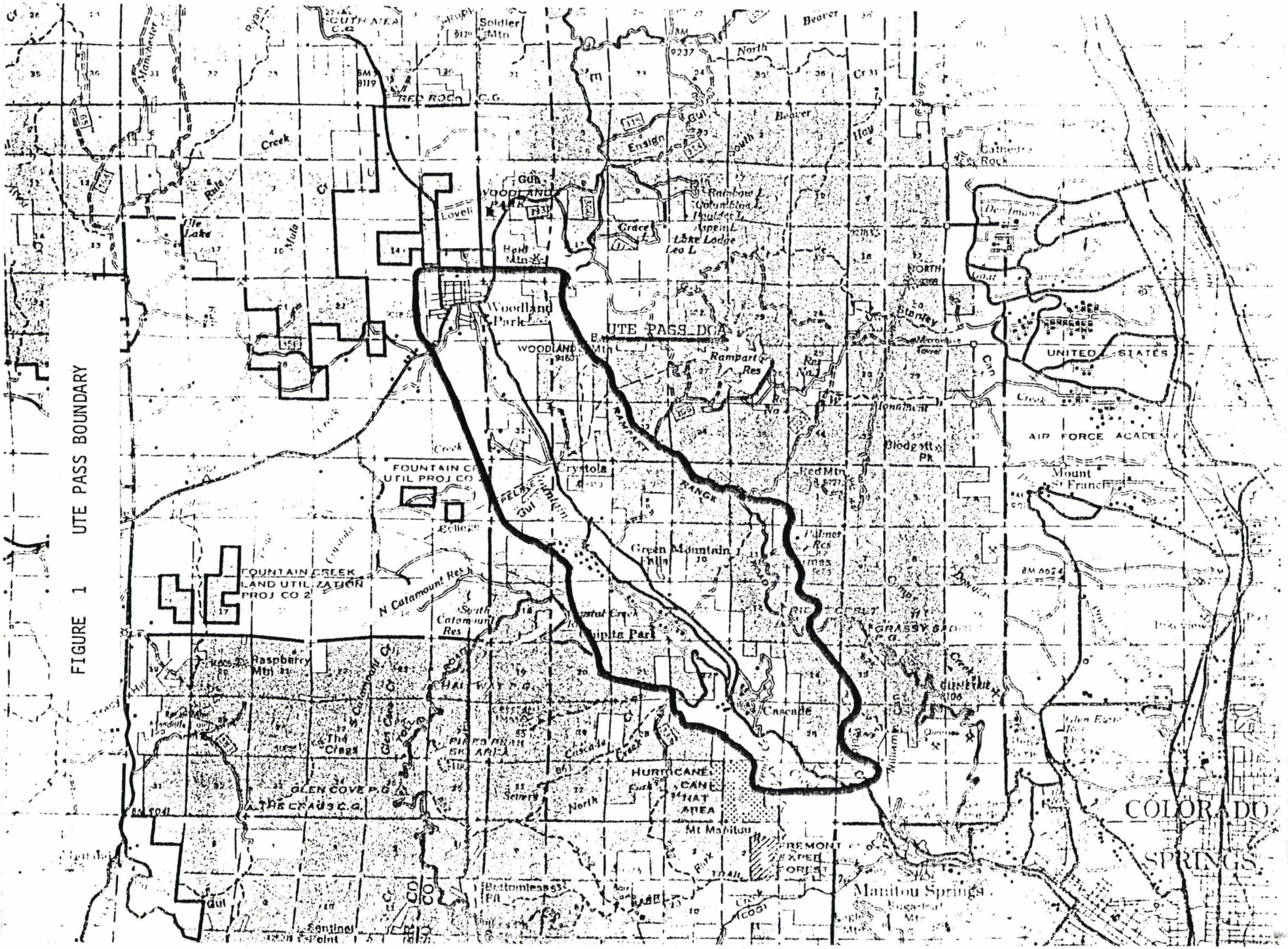
UTE PASS - AVERAGE DBH SUMMARY

| AREA | ALL SPECIES | RESIDUAL STAND | TOTAL PONDEROSA PINE | RESIDUAL PONDEROSA PINE | 1975 INFESTED PINE | 1976 INFESTED PINE |
|---|---|---|---|---|---|---|
| Wellington Gulch | 10.31 | 10.43 | 10.17 | 10.27 | 10.62 | 9.62 |
| Cascade | 9.86 | 10.04 | 10.55 | 10.36 | ----- | 12.34 |
| Crystola | 9.96 | 9.85 | 11.33 | 11.22 | 13.63 | 14.17 |
| Severy Creek | 10.82 | 10.23 | 11.22 | 10.54 | 12.17 | 14.74 |
| Green Mountain Falls | 11.01 | 10.66 | 11.00 | 10.64 | ----- | 13.50 |
| AVERAGE | 10.24 | 10.11 | 10.86 | 10.66 | 12.13 | 11.30 |

TABLE 4

UTE PASS - STAND COMPOSITION

| AREA | TOTAL STAND COMPOSITION PONDEROSA PINE | COMPOSITION RESIDUAL STAND | | | | LOSS TO MOUNTAIN PINE BEETLE | | DROP IN PONDEROSA PINE STAND COMPOSITION |
|---|---|---|---|---|---|---|---|---|
| | | PONDEROSA PINE | LIMBER PINE | DOUGLAS FIR | ASPEN | PONDEROSA PINE | LIMBER PINE | |
| | PERCENT | | | | | | | |
| Wellington Gulch | 75.62 | 67.69 | 2.08 | 22.27 | 7.96 | 10.49 | 46.05 | 7.93 |
| Cascade | 73.82 | 71.85 | 5.51 | 22.64 | ----- | 2.64 | ----- | 1.97 |
| Crystola | 65.97 | 65.07 | ---- | 9.68 | 25.25 | 1.36 | ----- | 0.90 |
| Severy Creek | 79.67 | 73.51 | ---- | 26.49 | ----- | 7.73 | ----- | 6.16 |
| Green Mountain Falls | 98.74 | 98.51 | ---- | 1.49 | ----- | 0.23 | ----- | 0.23 |
| AVERAGE | 74.96 | 71.33 | 1.89 | 17.48 | 9.30 | 4.84 | 12.26 | 3.13 |


Soldier Mtn
Beaver
North
RED ROCK C.G.
Creek
Ute
Woodland Park
Lovell
Rainbow L.
Columbine L.
Boulder L.
Aspen L.
Lake Lodge
Leo L.
Grace
Bald Mtn
UTE PASS DCA
Rampart Res
Stanley
UNITED STATES
AIR FORCE ACADE
Crystola
FOUNTAIN CR UTIL PROJ CO
Red Mtn
Mount St Francis
Green Mountain Falls
FOUNTAIN CREEK LAND UTILIZATION PROJ CO 2
N Catamount Res
South Catamount Res
Raspberry Mtn
Cascade
HURRICANE CANYON NAT AREA
GLEN COVE P.G.
PIKES PEAK SKI AREA
Mt Manitou
PIKE NATIONAL FOREST
Manitou Springs
COLORADO SPRINGS
Bottomless Pit
Sentinel Point
FIGURE 1 UTE PASS BOUNDARY

# PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key -- out of the reach of children and animals -- and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U. S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.